PHILIP MORRIS INCORPORATED

Law Department Memorandum
Richmond, Virginia

TO: J. E. Schardt DATE: September 15, 1986

FROM: B. A. Monroe

SUBJECT: Patentability Search: Ammonium Bicarbonate Treatment of Tobacco (PM 1244)

The inhouse patent database was searched, along with files on reconstituted tobacco, additives to tobacco, ammonia treatment of tobacco, and pH modification of cigarette delivery.

There is a considerable amount of art on alkali metal carbonates and/or bicarbonates, e.g., sodium bicarbonate, in filler or filters to improve the smoking characteristics. These patents are not included but examples can be furnished as background.

Those patents located which specifically disclose ammonium bicarbonate and/or carbonate are as follows. For related Philip Morris art the range was broadened somewhat to include various ammonium salts, complexes and/or treatment. Patents on ammonium carbamate expansion are not included, however.

Some of the other patents are also included merely as background. Ones considered more pertinent are indicated with an asterisk.

Philips US 246975

Treats raw tobacco with a solution of carbonate of ammonia in water (or can be added in dry state); tobacco then packed in cases and kept under heat to sweat and ferment. Treatment said to "neutralize" odors produced and improve quality of tobacco.

*Thienemann US 2822306

Tobacco is selectively denicotinized in presence of an alkalizing agent only in an amount corresponding to that necessary to react with the phosphoric acid-bound nicotine present. Preferred alkaline agents are ammonia or ammonium bicarbonate. The process is said to avoid "undesirable damage" to the smoking characteristics by use of excessive alkali, and the patent discloses a product that is "aromatic and pleasant tasting" as well as reduced in nicotine content.

Hind et al US 3411514

Treats rolled stems with ammonium phosphate or DAP for improved flavor. See also: 3411515 & 3353541.

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Hind US 3499454

Uses ammonium carbonate for pectin release as binder for reconstituted tobacco.

See also Hind, US 3420241 & 3529602 (use of ammonium or alkali metal salts for pH adjustment in substitute smoking material).

Hind, US 3616801 (removal of metallic ions such as potassium and addition of ammonium ion for smoother flavor).

Deszyck, US 3760815 (pectin release)

Hind, US 4129134 (cigarette wrapper treated with polysaccharide film-forming material including ammonium carbonate and other additives, see Ex. 2).

*Davis US 3638660

Substitute smoking material containing ammonium bicarbonate as "burn sustainer" or combustion modifier to affect delivery. Reads very much like CA 702920, George et al, Celanese.

Eicher et al US 3924642

Substitute smoking material containing, in addition to a metal chelate, a filler such as an ammonium salt of carbonic acid (ammonium carbonate), to split off ammonia, oxidizing agents and other components to improve smoking characteristics.

Miano US 4233993

Substitute smoking material contains ammonium carbonate as "blowing agent" to form expanded matrix in film or sheet.

*Seligman et al US 4256126

RL/pyrolyzed cellulose smoking composition contains alkali metal salt (carbonate, bicarbonate or phosphate) for reduced tar and nicotine delivery with improved combustion and subjective smoking characteristics. Ammonium salts disclosed (Col. 5) but ammonium bicarbonate not specifically discussed.

*Keritsis et al US 4333484

Alkali metal carbonates as additives in substitute smoking composition or tobacco blend includes an organic (C1-C8) acid or inorganic acid (carbonic) salt. The latter is preferably in "salt form as K, Na, NH4, Mg or Ca carbonate...to improve subjective taste characteristics of the smoke." Bicarbonate is not specifically mentioned but see cols. 9 & 10. Ammonium bicarbonate also included in a further treatment to precipitate certain metal(s) ions and enhance sheet formation (cols. 10,11,12) and as filler for more uniform combustion (col. 15).

See also: US 4314228 Keritsis (col. 6, pectin release in tobacco slurry), US 4506684 Keritsis (col. 4)

Lilly et al US 4607646 (pm

Ammonia treatment of Burley-like tobacco.

## Foreign References

Synectics UK 1185887

Substitute smoking device contains ammonium chloride, sodium bicarbonate and a variety of other additives in the filter to modify pH and taste of smoke. Contained or formed with tubular devices.

Frederickson UK 1331640

Ammonium bicarbonate as expansion agent.

*T. W. George et al CA 702920

Substitute smoking material containing ammonium bicarbonate as burn increaser (pp 3 & 4 & 6) and the presence of the carbonate is ~~through~~ throughout to promote more complete combustion and neutralize the acid content ~~as does the~~ ammonia release. Evolution of CO2 also said to affect smoke characteristics (p.22). See also p. 16. These all affect smoke characteristics. Tobacco blend also disclosed (p. 19).

Drebot CA 895111

Sodium or magnesium bicarbonate added to tobacco for "improved smoking characteristics" and self-extinguishing effect.

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